

## CLASS EXERCISES

For each function, give the equation of the axis of symmetry, the coordinates of the vertex, and the  $x$ - and  $y$ -intercepts.

- |                   |                      |                         |
|-------------------|----------------------|-------------------------|
| 1. $y = x^2 + 6x$ | 2. $y = -2x^2 - 8x$  | 3. $y = x^2 - 6x + 9$   |
| 4. $y = x^2 - 4x$ | 5. $y = -3x^2 + 10x$ | 6. $y = -4x^2 - 4x + 3$ |

Sketch the graph of each function.

- |                   |                     |                       |
|-------------------|---------------------|-----------------------|
| 7. $y = x^2 + 6x$ | 8. $y = -2x^2 - 8x$ | 9. $y = x^2 - 6x + 9$ |
|-------------------|---------------------|-----------------------|

## PRACTICE EXERCISES



Use technology where appropriate.

For each function, give the equation of the axis of symmetry, the coordinates of the vertex, and the  $x$ - and  $y$ -intercepts.

- |                         |                               |                               |
|-------------------------|-------------------------------|-------------------------------|
| 1. $y = -x^2 + 2x$      | 2. $y = x^2 - 3x$             | 3. $y = -2x^2 - 4x$           |
| 4. $y = 2x^2 + 4x$      | 5. $y = x^2 + 6x + 9$         | 6. $y = x^2 + 2x - 8$         |
| 7. $y = x^2 + 8x + 16$  | 8. $y = x^2 + 3x - 4$         | 9. $y = 2x^2 - 5x + 2$        |
| 10. $y = 3x^2 - 2x - 1$ | 11. $y = \frac{1}{2}x^2 + 4x$ | 12. $y = \frac{1}{2}x^2 - 6x$ |

Sketch the graph of each function.

- |                         |   |                                 |
|-------------------------|---|---------------------------------|
| 13. $y = -x^2 + 2x$     | 14. $y = x^2 - 3x$                          | 15. $y = -2x^2 - 4x$            |
| 16. $y = 2x^2 + 4x$     | 17. $y = x^2 + 6x + 9$                      | 18. $y = x^2 + 2x - 8$          |
| 19. $y = 2x^2 - 7x + 6$ | 20. $y = -3x^2 + 4x - 1$                    | 21. $y = 4x^2 - 12x + 9$        |
| 22. $y = 3x^2 - 2x - 1$ | 23. $y = \frac{1}{2}x^2 - \frac{3}{2}x + 1$ | 24. $y = x^2 - x - \frac{3}{4}$ |

Determine whether each function has a maximum or a minimum value. Then find that value.

- |                         |                         |                          |
|-------------------------|-------------------------|--------------------------|
| 25. $y = -x^2 + 2x + 5$ | 26. $y = 3x^2 - 4x - 2$ | 27. $y = -2x^2 - 3x + 4$ |
| 28. $y = 5 - x^2$       | 29. $y = 6x + 3x^2$     | 30. $y = 6 - x^2 - x$    |
31. Given the function  $y = ax^2 + bx - 27$ , for what values of  $a$  and  $b$  will the vertex be at  $(2, -3)$ ?
32. Given the function  $y = ax^2 + bx + 5$ , for what values of  $a$  and  $b$  will the vertex be at  $(-1, 4)$ ?
33. Given the function  $y = ax^2 + bx$ , for what values of  $a$  and  $b$  will the vertex be at  $(-3, 2)$ ?
34. Given the function  $y = 2x^2 + bx + c$ , for what values of  $b$  and  $c$  will the vertex lie at the intersection of the  $x$ -axis and the line  $x = 1$ ?